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Some Problems in Ensuring the Coordination of the Air Forces  
and Air Defenses of the Socialist Countries

by

General-Mayor of Aviation  
M. Piskunov

War games and exercises conducted in recent years have shown that organizing and ensuring the coordination of the air forces and air defenses of the Warsaw Pact countries engaged in the joint fulfilment of tasks poses certain difficulties. This gives rise to the need of precisely determining the structure of the coordinating echelons, of establishing a harmonious system of control posts, and of increasing the amount, and improving the quality, of the means which support the coordinating control posts.

This article is devoted to an examination of some of these problems.

Thus, in combined exercises of the air forces and air defenses of the Group of Soviet Forces in Germany, East Germany, Poland, and Czechoslovakia, conducted from 1965 to 1967, coordination was carried out between the command post of the air army and the air defenses of the Group of Soviet Forces in Germany on the one hand, and between the central command post of the air forces and the air defenses of these countries on the other hand. In all cases, operational groups were allocated to the coordinating control posts, and the organic means available at these posts were used.

In most cases coordination was carried out from stationary control posts by using available landline channels and radiotechnical means. Under these conditions, the coordinating control posts for the most part were able to cope with their task, even though there were certain difficulties caused by a lack of the necessary amount of forces and means and by the unstable operation of these forces and means.

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Under field conditions there will be no opportunity for the prior preparation of the required communication channels. It will be necessary to ensure coordination, not by landline channels and the use of stationary radiotechnical means, but by the use of field means of communication.

Therefore, it has become necessary to determine beforehand the structure of the coordinating control posts and to calculate the quantity of communications means, radiotechnical equipment, and automated systems required to ensure coordination.

Analyzing available experience and taking into consideration the possible development of modern operations, we may conclude that coordination between the air army of a Soviet Army front and the air forces and air defenses of allied countries will be implemented at all echelons down to aircraft crews. Exceptionally precise coordination will have to be organized between fighter aviation and surface-to-air missile units when repulsing massive enemy air raids, since, as is well-known, maximum speed and efficiency are required when joint combat tasks are being fulfilled.

Such coordination of allied countries will be organized on the basis of directives of the Commander-in-Chief and staff of the Combined Armed Forces of the Warsaw Pact member states.

The degree of detail in these directives will naturally depend on the available forces and means at the disposal of the commander-in-chief and on the nature of the tasks to be accomplished by them in the operation. However, in all cases it would be desirable if the directives clearly set forth who should coordinate with whom and during which phases of the operation, which kind of coordinating posts are to be organized and with whose means they are to be supported; and it would also be desirable if the directives had provisions for the lines of transfer of control of aircraft in the air, the landing fields of coordinating large units, the zones of coverage of the radar fields of coordinating armies, and the procedure for augmenting these zones in the course of the operation. As shown by the experience of exercises, it is most advisable to organize such coordination along the axes of the air forces and air defenses of each country.

We visualize the coordinating control posts to be structured as follows:

- between the command post of the front air army and the central command post of the air forces and air defenses of the allied countries;
- between the control post of the deputy air army commander for air defense and the central command post of the air forces and air defenses of the allied countries;

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the allied countries;

--between the command posts of the aviation large units of the air army and the command posts of the aviation large units of the air forces and air defenses of the allied countries;

--between the aviation representatives at the surface-to-air missile units and the fighter aviation of the air army and the air forces and air defenses of the allied countries;

--between air army aircraft and the aircraft of the air forces and air defenses of the allied countries when fulfilling joint combat tasks.

All of these coordinating control posts must be provided with an adequate amount of communications means, radiotechnical equipment, and high-quality automated systems.

What requirements must be placed on the means which support coordination? First of all, the capability of quickly deploying and regrouping communications centers and radiotechnical support--no more than 30 minutes (10 to 15 minutes for individual types of means), and the capability of operating while on the move. The transmission capacity of these means should be such that all operational-tactical information between coordinating control posts can pass through the centers without delay and that transmission can be effected in the shortest possible time.

Information must be transmitted by telephone and telegraph, and by introducing data into an automated system. To achieve this, between each coordinating control post there must be at least one each of telephone, telegraph, and telecode channels.

The reliability of the equipment used will depend on its quality, the probability it will not be destroyed by the enemy fire means, its jamming resistance, and the extent of training of the specialists of the coordinating armies.

It is advisable that the communications means, radiotechnical equipment, and automated systems which ensure coordination have a reliability of at least 0.98. To achieve this reliability during a "hot emergency", estimates show that it is necessary that there be one emergency communications channel and one radiotechnical support facility between each coordinating control post.

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The exchange of information between coordinating control posts must be carried out with an exceptionally high reliability. This is particularly important in the coordination between fighter aircraft and surface-to-air

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missile units, when the loss of a single character or of several characters during transmission (reception) may lead to the non-fulfilment of a combat task. According to calculations, the reliability of the means ensuring coordination should be no lower than 10- .

It is very important to conceal the operation of all radioelectronic means from enemy reconnaissance and to use secure communications devices on all of the channels over which operational-tactical information is circulated between coordinating control posts. As shown by operating experience, the secure communications device must be an integral part of the channel, i.e., it must be organically incorporated into the means which ensure coordination, it must have assured stability, and it must permit rapid tuning and adjustment under field conditions.

The requirements discussed by us are also used as the basis for calculations to determine the quantity of communications means, radiotechnical equipment, and automated systems necessary to support the control posts of the air army and aviation large units coordinating with the air forces and air defenses of the allied countries.

As was indicated above, it is essential to establish telephone, telegraph, and telecode channels between each coordinating control post. Since the distance separating the control posts from one another in an offensive operation may reach 500 to 600 kilometers, the organization of independent radio-relay communications has to be ruled out (because of the great number of relay stations). It is therefore most advantageous to base ourselves on front and inter-country radio-relay axes and lateral lines of communications, on which even in peacetime it is necessary to provide for the allocation of telephone, telegraph, and telecode channels for all of the coordinating control posts of formations and large units of the Soviet Army and of the armies of the socialist countries.

But these measures alone are not enough to ensure high reliability of communications. The coordinating formations and large units of these armies must have the kind of means which would allow them to set up an independent communications net among the appropriate control pos50X1-HUM

A tropospheric radio set is the most reliable and suitable means for this purpose, since it permits the simultaneous availability of several telephone and telegraph channels at distances of 250 to 500 kilometers, thereby ensuring, for the most part, continuous communications during an entire operation. Such communications should be organized on the principle of 'meeting each other', each coordinating control post should have two

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tropospheric stations, one of which should be earmarked for radio-relay (if the distance between control posts exceeds 250 kilometers).

To ensure the viability and stability of communications, there is also a need for surface radio communications which it is advantageous to organize along radio links on single side-band radio sets with the establishment of telephone, telegraph (printing telegraphy), and telecode channels. For this, it is necessary to allocate one or two radio sets to each coordinating control post.

For the purpose of secure communications channels, each control post should have one or two sets of telephone and telegraph secure communications equipment.

To guide fighter aircraft and to ensure their coordination with surface-to-air missile units, it is advisable that aviation large units have 50 percent overlapping radar coverage on either side of the boundary lines between them. This requires (especially to ensure coordination at low altitudes) the establishment of supplementary radar systems at distances of no more than 50 kilometers from the boundary line. Each aviation representative at surface-to-air missile unit command posts should have a similar radar system, with the help of which the guidance navigator could track fighter aircraft and direct their movements in the zone of actions of the surface-to-air missile units.

All coordinating control posts must be issued electronic plotting boards which would display the air situation in the zones of the coordinating formations and large units. It would be desirable to transmit the data for these plotting boards over telecode channels. 50X1-HUM

For the battlefield control (guidance) of fighter and fighter-bomber aircraft of coordinating large units, it is necessary to have one or two ultra-short-wave (decimetric wave) radio sets at every coordinating control post and to make prior arrangements on operating procedures with aircraft aloft (including the use of an automated system) and to know the operating frequencies and callsigns. Since aircraft are now beginning to be equipped with a radiotechnical system for short-range navigation, the use of this system in the zones of coordination (within 40 to 50 kilometers from the boundary lines) requires the establishment of appropriate surface stations and an agreement on their operating procedure. 50X1-HUM

In accordance with the coordination plans of air forces formations and large units (in an operation, airfields are allocated) where aircraft of

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the armies of allied countries can land (and vice-versa).

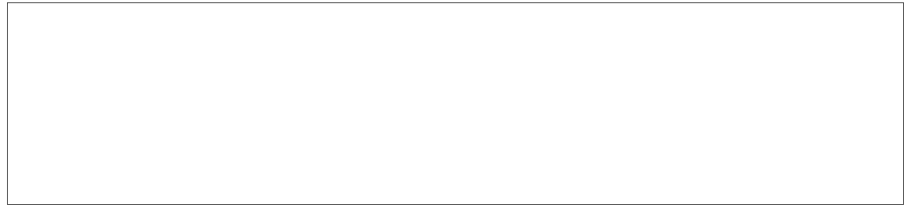
Therefore, each of these airfields should have a special radio set and a common channel for the command-start communications of the coordinating large units and units.

Thus, to ensure coordination on each axis (only with the air forces and air defenses of one country), it is necessary to allocate to the coordinating control posts (up to, and including, aviation large units) two tropospheric sets, one or two single side-band and one or two ultra-shortwave (decimetric wave) radio sets, two sets of secure communications devices, one or two radar guidance systems, one or two radiotechnical sets of short-range navigation systems, and one electronic plotting board to display the air situation. This requires that communications units (subunits) and air forces radiotechnical troops have supplementary forces and means in order that they may meet the requirements of coalition warfare.

The linking of the equipment of communications centers and radiotechnical support of coordinating armies will play an important part in ensuring coordination. Therefore, the coordinating centers should: agree beforehand regarding all important technical questions; exchange necessary data; establish mutual understanding and the exact meaning of all technical terms; draw up procedure charts for discussions by specialists in the languages of their countries; and carry out, as often as possible, combined training in the integrated linking of the equipment of the communication centers.

The fulfilment of such complex and responsible work is inconceivable without the presence of a single organ which would be able to work out the procedures and methods of employing communications means, radiotechnical devices, and automated systems; to make suggestions for the organization and establishment of units and subunits designated to ensure coordination; to recommend models of communications and radiotechnical support equipment for the air forces and air defenses of the countries of the coordinating armies; and to coordinate the use of this equipment and the training and preparation of the specialists. For this purpose, we believe, it would be advisable for the headquarters of the Combined Armed Forces to have a special communications and radiotechnical support group for the coordination of the air forces and air defenses; this group should contain representatives of the air forces and air defenses of all the Warsaw Pact member states.

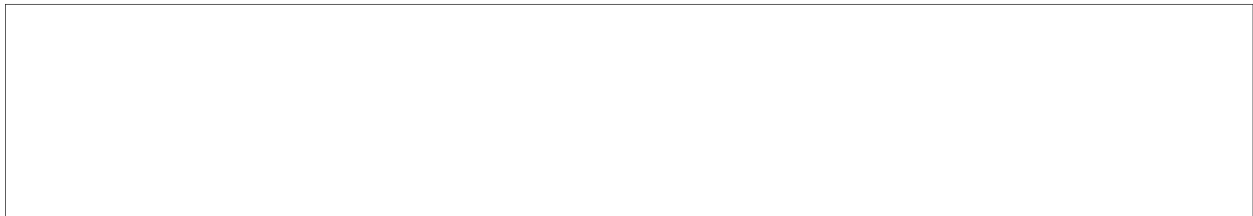
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We should work out in peacetime the coordination at all levels of the forces of the coordinating armies, and maintain all coordinating control posts and their support means in a state of full combat readiness.

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